

WHAT IS CLAIMED IS:

5.6 A. > 1. An image scanning apparatus comprising:

5 a light source for emitting visible light and invisible light;

scanning means for scanning an original image irradiated with light emitted by said light source; and

control means for controlling said scanning means to scan the original image irradiated with the invisible
10 light, and then to scan the original image irradiated with the visible light.

2. The apparatus according to claim 1, wherein when the original image is irradiated with the visible light, the original image is scanned in a rough scan for
15 roughly scanning the original image, and in a fine scan for scanning the original image under a required condition on the basis of information scanned in the rough scan.

5.6 A. > 3. The apparatus according to claim 2, wherein said
20 control means controls said scanning means to make the rough scan after said scanning means scans the original image irradiated with the invisible light, and then to make the fine scan.

4. The apparatus according to claim 2, wherein said
25 control means controls said scanning means to scan the

original image irradiated with the invisible light after the rough scan, and then to make the fine scan.

5 5. The apparatus according to claim 1, further comprising detection means for detecting abnormality on an original by scanning the original image irradiated with the invisible light.

6. The apparatus according to claim 5, wherein the abnormality on the original is caused by dust or scratches on the original.

10 7. The apparatus according to claim 5, further comprising signal processing means for, when said detection means detects the abnormality, executing signal processing for correcting an influence of the abnormality from the image signal output from said
15 scanning means.

8. The apparatus according to claim 1, wherein the invisible light is infrared light.

9. An image scanning method comprising:

20 the scanning step of scanning, by scanning means, an original image irradiated with light emitted by a light source which emits visible light and invisible light; and

25 the control step of controlling said scanning means to scan the original image irradiated with the invisible light, and then to scan the original image irradiated with the visible light.

10. A storage medium storing a computer program for scanning image information on an original, said computer program including:

5 a code of the step of scanning the image information by irradiating the original with invisible light; and

a code of the step of then scanning the image information by irradiating the original with visible light.

10 11. An image scanning apparatus for scanning image information of a transparent original by a relative reciprocal motion between the transparent original and photodetection means for detecting light transmitted through the transparent original, comprising:

15 emission means for emitting light in a first wavelength range and light in a second wavelength range with respect to the transparent original; and

control means for controlling to scan image information from the transparent original by the light
20 in the first wavelength range in a motion in one direction of the reciprocal motion, and to scan image information from the transparent original by the light in the second wavelength range in a motion in the other direction of the reciprocal motion.

25 12. The apparatus according to claim 11, wherein the transparent original is an original such as a developed

photographic film or the like, the light in the first wavelength range is visible light, and the light in the second wavelength range is infrared light.

13. The apparatus according to claim 11, wherein said
5 control means controls to scan image information from the transparent original by a rough scan for obtaining rough image information of the transparent original by visible light, a fine scan for obtaining image
information of the transparent original by visible light
10 with designated image quality, or an infrared light scan for obtaining image information of the transparent original by infrared light.

14. The apparatus according to claim 13, wherein said control means controls to make the infrared light scan
15 in one of two reciprocal motions for respectively making the rough scan and fine scan.

15. The apparatus according to claim 14, wherein said control means controls to make the infrared light scan in the motion in one direction of the reciprocal motion
20 for making the rough scan.

16. The apparatus according to claim 14, wherein said control means controls to make the infrared light scan in the motion in one direction of the reciprocal motion for making the fine scan.

25 17. An image scanning apparatus for scanning image information of a transparent original by a relative

emission means for emitting light in a first wavelength range and light in a second wavelength range with respect to the transparent original; and

wherein an operation mode that skips a scan for image information by the light in the second wavelength range upon scanning the image information of the transparent original is selectable.

19. The apparatus according to claim 11, further
comprising a physical device which is placed on a light
incoming side of the photodetection means, and can
control transmittances of the light in the first
wavelength range and the light in the second wavelength
range, and wherein said control means controls spectral
transmission characteristics of said physical device.

skip infrared
or
length scan

2nd $\gamma = \text{increased}$
 \therefore less/no cluster search

3rd emb. p. 32
L26. 20
device 40.
- 88.

20. The apparatus according to claim 11, wherein said emission means comprises a first emission section for emitting the light in the first wavelength range, and a second emission section for emitting the light in the second wavelength range, and said control means controls to turn on/off said first and second emission sections of said emission means.

21. An image scanning method applied to an image scanning apparatus for scanning image information of a transparent original by a relative reciprocal motion between the transparent original and photodetection means for detecting light transmitted through the transparent original, comprising:

the emission step of emitting light in a first wavelength range and light in a second wavelength range with respect to the transparent original; and

the control step of controlling to scan image information from the transparent original by the light in the first wavelength range in a motion in one direction of the reciprocal motion, and to scan image information from the transparent original by the light in the second wavelength range in a motion in the other direction of the reciprocal motion.

22. An image scanning method applied to an image scanning apparatus for scanning image information of a transparent original by a relative reciprocal motion

between the transparent original and photodetection means for detecting light transmitted through the transparent original, comprising:

the emission step of emitting light in a first wavelength range and light in a second wavelength range with respect to the transparent original; and

the control step of controlling to scan image information from the transparent original,

wherein an operation mode that skips a scan for image information by the light in the second wavelength range upon scanning the image information of the transparent original is selectable.

23. A computer readable storage medium, which stores a program for implementing an image scanning method applied to an image scanning apparatus for scanning image information of a transparent original by a relative reciprocal motion between the transparent original and photodetection means for detecting light transmitted through the transparent original,

said image scanning method having the emission step of emitting light in a first wavelength range and light in a second wavelength range with respect to the transparent original, and the control step of controlling to scan image information from the transparent original by the light in the first wavelength range in a motion in one direction of the

$\leftarrow 2nd \lambda = IR$

less/no dust/scratch
 $\leftarrow 2nd \lambda = IR$

$1st \lambda = IR$

reciprocal motion, and to scan image information from the transparent original by the light in the second wavelength range in a motion in the other direction of the reciprocal motion.

- 22 ~
- 5 24. A computer readable storage medium, which stores a program for implementing an image scanning method applied to an image scanning apparatus for scanning image information of a transparent original by a relative reciprocal motion between the transparent
- 10 original and photodetection means for detecting light transmitted through the transparent original,

said image scanning method having the emission step of emitting light in a first wavelength range and light in a second wavelength range with respect to the

15 transparent original, and the control step of controlling to scan image information from the transparent original, wherein an operation mode that skips a scan for image information by the light in the second wavelength range upon scanning the image

information of the transparent original is selectable.

2nd $\lambda = IR$

- see also p. 20
[only 2 scans]
for 3 type scans
ind. p. 34
25. An image scanning apparatus for scanning image information on an original by a relative reciprocal motion between the original and a line sensor, comprising:

25 scan means for making three types of scans including a rough scan for scanning the image

information by visible light at a low resolution, a fine scan for scanning the image information by visible light at a high resolution, and an invisible light scan for scanning the image information by invisible light,

5 wherein said scan means makes the invisible light scan at a lower resolution than the fine scan.

26. The apparatus according to claim 25, wherein the invisible light scan is to scan dust or scratch information on the original.

10 27. The apparatus according to claim 25, wherein said scan means makes the rough scan in a motion in one direction of the reciprocal motion, and makes the invisible light scan in a motion in the other direction of the reciprocal motion.

15 28. The apparatus according to claim 25, wherein said scan means simultaneously makes the rough scan and invisible light scan in a motion in one direction of the reciprocal motion.

20 29. The apparatus according to claim 28, wherein said scan means makes the fine scan in a motion in the other direction of the reciprocal motion.

30. The apparatus according to claim 25, wherein said scan means has a mode for skipping the invisible light scan, and the mode is selectable.

25 31. The apparatus according to claim 25, wherein the invisible light is infrared light.

32. The apparatus according to claim 25, wherein the original is a film original.

33. The apparatus according to claim 25, wherein the original is a transparent original.

5 34. An image scanning method for scanning image information on an original, comprising:

the rough scan step of scanning the image information by visible light at a low resolution;

10 the fine scan step of scanning the image information by visible light at a high resolution;

the invisible scan step of scanning the image information by invisible light at a lower resolution than the resolution in the fine scan step.

15 35. A storage medium storing a computer program for scanning image information on an original, said computer program including:

a code of the rough scan step of scanning the image information by visible light at a low resolution;

20 a code of the fine scan step of scanning the image information by visible light at a high resolution;

a code of the invisible scan step of scanning the image information by invisible light at a lower resolution than the resolution in the fine scan step.

25 36. An image scanning apparatus for scanning image information on an original by a scan attained by a

relative motion between the original and a line sensor,
comprising:

emission means for emitting visible light and
invisible light; and

5 scan means for making two types of scans including
a visible light scan for scanning the image information
by visible light, and an invisible light scan for
scanning the image information by invisible light,

wherein said scan means completes the invisible
10 light scan within a shorter period of time than the
visible light scan.

37. An image scanning apparatus for scanning image
information on an original by a scan attained by a
relative motion between the original and a line sensor,
15 comprising:

emission means for emitting visible light and
invisible light; and

scan means for making two types of scans including
a visible light scan for scanning the image information
20 by visible light, and an invisible light scan for
scanning the image information by invisible light,

wherein said scan means makes the invisible light
scan by a relative motion at a higher speed than a
relative motion for the visible light scan.

25 38. The apparatus according to claim 36, wherein an
output signal level of the line sensor in the invisible

light scan is lower than an output signal level in the visible light scan.

39. The apparatus according to claim 36, wherein spectral intensity characteristics of said emission
5 means have a higher emission intensity in an invisible light wavelength range than an emission intensity in a visible light wavelength range.

40. The apparatus according to claim 36, wherein spectral sensitivity characteristics of the line sensor
10 have a higher sensitivity in an invisible light wavelength range than a sensitivity in a visible light wavelength range.

41. The apparatus according to claim 36, wherein said scan means has a mode for skipping the invisible light
15 scan, and the mode is selectable.

42. The apparatus according to claim 36, wherein the invisible light is infrared light.

43. The apparatus according to claim 36, wherein the original is a film original.

20 44. The apparatus according to claim 36, wherein the original is a transparent original.

45. An image scanning method for scanning image information on an original by a scan attained by a relative motion between the original and a line sensor,
25 comprising:

the visible light scan step of making a scan by
the relative motion using visible light; and

the invisible light scan step of making a scan
using invisible light within a shorter period of time
5 than the visible light scan step.

46. An image scanning method for scanning image
information on an original by a scan attained by a
relative motion between the original and a line sensor,
comprising:

10 the visible light scan step of making a scan by
the relative motion using visible light; and

the invisible light scan step of making a scan
using invisible light by a relative motion at higher
speed than a relative motion for the visible light scan
15 step.

47. A storage medium storing a computer program for
scanning image information on an original by a scan
attained by a relative motion between the original and a
line sensor, said computer program including:

20 a code of the visible light scan step of making a
scan by the relative motion using visible light; and

a code of the invisible light scan step of making
a scan using invisible light within a shorter period of
time than the visible light scan step.

25 48. A storage medium storing a computer program for
scanning image information on an original by a scan

attained by a relative motion between the original and a line sensor, said computer program including:

5 a code of the invisible light scan step of making
a scan using invisible light by a relative motion at
higher speed than a relative motion for the visible
light scan step.